



# Naval Medical Research and Development

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## News Releases

### The Mosquito Fighters, Part IX: Klamath Falls and the Navy's Forgotten Filariasis Problem

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By André B. Sobocinski, Historian, BUMED



Col. Charles Brooks (l) and Capt. Lowell T. Coggeshall (r) explain the layout of Klamath Falls to Governor Earl Snell, February 1946. Courtesy of the Oregon Historical Society.

*"Filariasis in the personnel of our Armed Forces is a problem which has arisen since operations were started in the South and Central Pacific area."*

~Vice Adm. Ross McIntire, Navy Surgeon General, to Hon. William Stigler (D-OK), June 20, 1944.

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Tutuila Island (Samoa), 1880. After conducting a medical survey of the island, USS *Alaska's* surgeon Thomas Hiland reported that four-fifths of the population over the age of 45 suffered from a condition marked—in severe cases—by skin/tissue thickening, swelling of limbs (elephantiasis) and scrotal swelling (hydrocele).

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Decades away from the discovery of the actual cause, Hiland attributed the condition to the “warm, moist climate” of Tutuila and advised use of quinine, rest and purging. In six cases of hydrocele, he and fellow physician Asst. Surgeon S.H. Griffith surgically removed the hypertrophied mass (the largest weighing 40 pounds!)

Today we know this horrifying disease by the name lymphatic filariasis. A potentially chronic condition, filariasis is caused by parasitic roundworms that can be transmitted by *Aedes*, *Anopheles* and *Culex* species of mosquitoes. According to the World Health Organization (WHO), the *Wucheria bancrofti* parasite is responsible for 90 percent of lymphatic filariasis cases worldwide.

When injected into a host’s bloodstream, the microfilariae (larval stage worms) can grow up to four inches in length and lodge in the lymph glands where they continually reproduce over a lifespan of 5 to 7 years. These blockages can lead to an accumulation of lymph fluid leading to elephantoid enlargement of limbs and body parts.

Most individuals who contract filariasis, however, remain asymptomatic and diagnosis is usually only made through identification of microfilariae in blood smears. Less than 10 percent of cases actually manifest in elephantiasis.

Although the Navy has never been overrun with the disease it has not been immune to it either. Remarkably, between 1915 and 1945, there were only two years in which sailors or Marines were not diagnosed with filariasis. In World War II—with the swell of deployed military populations in endemic areas—Navy physicians diagnosed some 12,040 cases (over 90 percent of those being Marines).

Filariasis not only comprised an individual’s lymphatic system, it posed a serious psychological threat for service personnel who feared manifestations of elephantiasis, spreading the infection and subsequent social stigma. Navy doctors also reported an overwhelming, yet unfounded fear of sterility among afflicted personnel.

Although there was no cure for the disease, Navy researchers noted that the cooler climates at higher altitudes made for amenable conditions in the recovery process. In April 1944, the Navy—in conjunction with the Marine Corps—established a special rehabilitation and research facility in Klamath Falls, Ore., specifically for filariasis patients.

Located 4,200 above sea level and along the Southern Pacific Railroad line in Southern Oregon, the 800 acre-facility was composed of 80 buildings and could accommodate up to 5,000 patients at one time. Due in part to the sensitivities of infected personnel, the medical facility was dubbed a “Marine Barracks” rather than a hospital or rehabilitation center.

Between April 1944 and November 1945 the Marine Barracks at Klamath Falls averaged 2,110 patients, the overwhelming majority being Pacific War veterans with filariasis, although relapsing malaria cases were also admitted.

Typically, patients underwent a three-month “supervised reconditioning” program to strengthen immune systems that would be fighting the parasite. For Cmdr. Lowell Coggeshall, the Chief Medical Officer of the Barracks, it was imperative to keep the patients active and their minds occupied. As he remarked, “. . .they must be kept busy enough to eat well, and tired enough to sleep well. The stronger they are, the better they can combat any ailments.”

Most patients were ambulatory and were required to perform normal garrison activities and close-order drills under medical supervision. There were endurance hikes up Mount Shasta,

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construction work on base and vocational therapy—some patients even served the nearby community as auxiliary firemen and harvested crops in local farms.

Under Coggeshall’s direction, Klamath Falls also took part in cooperative efforts with the National Research Council and Public Health Service in evaluating chemotherapeutic and other treatments for the disease.

Filariasis was never considered grounds for automatic discharge from the service and most patients were returned to active duty. Special notations would be placed in their health records requesting their return to Klamath Falls should relapse occur. Starting in October 1944, Klamath Falls admissions were added to a first of its kind, a “Filariasis Registry” in order to keep them under surveillance while on active duty.

With post-war demobilization, a rapidly dwindling patient population and a minimal risk of relapse, military officials determined that Klamath Falls was no longer needed. On February 28, 1946, the Marine Barracks at Klamath Falls was disestablished.

Although no longer a concern facing the U.S. Navy, filariasis remains a serious public health issue world-wide. As of 2016, lymphatic filariasis remains endemic in 73 countries and affects over 120 million people. Even though there is still no cure, infected individuals can take the drugs **albendazole** and **diethylcarbamazine (DEC)** which can eradicate microfilariae in the bloodstream and prevent transmission.

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